Vehicle Technology and Trends 2013

Module 1

I-CAR®

NEW13-INMAN1-E

IMPORTANT NOTICE

This material provides general directions for collision damage repair using tested, effective procedures. Following them will help assure the reliability of the repair.

I-CAR cannot accept responsibility for any individual repair, nor can it warrant to the quality of such repair. Anyone who departs from the instructions in this program must first establish that neither personal safety nor the integrity of the repair of the vehicle is compromised by the choice of methods, tools, or supplies.

I-CAR does not endorse or recommend any brands or makes of vehicles, repair equipment and supplies or other products. The appearance of various makes and brand names in any I-CAR material is purely coincidental and is based on the availability of those products at the time of production.

All recommendations presented in this program are based upon research programs or upon tests conducted by laboratories, manufacturers, or selected collision repair facilities. If performed as outlined, these recommendations will provide the basis for a thorough, professional repair.

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Class 0:49

A-1

MODULE 1–TRENDS AND INDUSTRY INFLUENCES

Topic A. Manufacturing Trends

Learning Objectives

Learning objectives for this module include:

- **describing manufacturing trends prompted by necessity or consumer demand.**
- **describing manufacturing trends prompted by government mandates.**
- **describing new repair technologies.**

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- describing manufacturing trends prompted by necessity or consumer demand.
- describing manufacturing trends prompted by government mandates.
- describing new repair technologies.

Notes

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Topic A. Manufacturing Trends (cont'd)

A-2

A Look At What's New

Acura NSX Concept

This course is a glance at what is coming into repair facilities. It is designed to present and discuss trends and technologies relevant to the collision repair industry introduced for the 2013 model year.

"Vehicle Technology and Trends 2013" is different from some other I-CAR courses in that:

- it is not a "How-To" type of course, detailing procedures for repair.
- there are limited details on many of the subjects introduced. It is intended to be an overview of the technology and trends. More information on many of the subjects is or will be covered in other I-CAR training courses.
- some concept information is presented to provide information on possible directions the industry is heading toward. This information is all in the last module. The rest of the course, 85% of the information, is about vehicles and technology on the road today.

Notes

It may be helpful to ask how many students attended the I-CAR live "Vehicle Technology and Trends 2010 (NEW10)" and "Vehicle Technology and Trends 2011 (NEW11)," as this course is laid out similarly.

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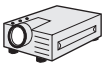
Topic A. Manufacturing Trends (cont'd)



A-3v

Video: Tech/Trends Trivia

Notes

Explain that this is the first of many trivia questions that will be asked throughout the course. Set up the rules for answering the questions, depending on the size of the class and other factors. A prize could be awarded at the end of the class to whoever accumulates the most correct answers. If you will be awarding a prize, it could be announced at this time. Work with committee members to obtain a prize.

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Topic A. Manufacturing Trends (cont'd)

A-4

Aluminum Demand Rises

Mercedes-Benz SL

One of the major trends for the 2013 model year, from a body perspective, is a rise in the use of aluminum. The use of this construction material lowers the weight of vehicles for more fuel efficiency. As the 2025 deadline looms for U.S. vehicle makers to achieve a corporate average fuel economy (CAFÉ) of 54.5 miles per gallon, many vehicle makers are turning toward aluminum for part of the answer. Examples of this trend include:

- Alcoa Aluminum expanding its Iowa facility primarily due to the rising demand from vehicle makers. A spokesman for the company said that the expansion is for business already secured. Alcoa expects that growing demand for aluminum from the auto industry will cause aluminum shortages in the near future. Another aluminum panel maker, Novelis, is tripling its U.S. production capacity of automotive sheet aluminum and expanding their plant in Oswego, New York.

Notes

There will be more information on the 2013 Mercedes-Benz SL in Module 4.

Objectives Worksheet

One of the major trends for the 2013 model year is a rise in the use of aluminum. The use of this construction material lowers the weight of vehicles for more fuel efficiency. As the 2025 deadline looms for U.S. vehicle makers to achieve a corporate average fuel economy (CAFÉ) of 54.5 miles per gallon, many vehicle makers are turning toward aluminum for part of the answer.

Mercedes-Benz released what they call their first high-production, aluminum-intensive vehicle, the SL, in 2013.

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Topic A. Manufacturing Trends (cont'd)

- Honda saying that they are reaching the limits of high-strength steel (HSS).
- Mercedes-Benz releasing what they call their first high-production, aluminum-intensive vehicle, the SL.

Another example of the rising popularity of aluminum is the release of another I-CAR live course on aluminum repair, *"Aluminum-Intensive Vehicle Repairs (ALI01)."*

Notes

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Topic A. Manufacturing Trends (cont'd)

A-5

Aluminum Demand Rises (cont'd)

Porsche 911

Other examples of the trend toward aluminum for vehicle makers include:

- Tata Motors saying that all future Land Rovers and Jaguars will be aluminum-intensive.
- Porsche saying that most future Porsche vehicles will have an aluminum/steel structure, similar to the 2013 911.

A 2011 survey of North American vehicle makers reports that aluminum is expected to increase in use from 154 kilograms (340 pounds) per vehicle today to 249 kilograms (550 pounds) per vehicle in 2025.

Notes

There will be more information on the 2013 Porsche 911 in Module 4.

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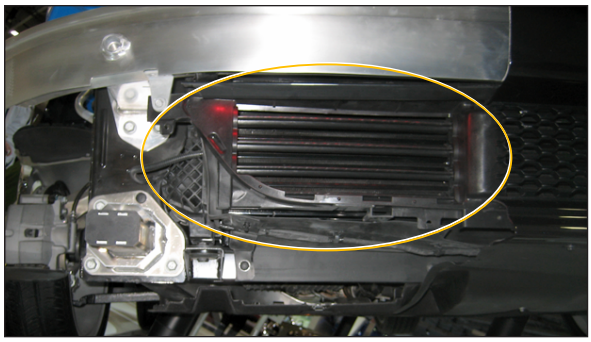
Topic A. Manufacturing Trends (cont'd)

A-6

More Active Grille Shutters



A gadget designed to provide better fuel efficiency is an active grille shutter. Active grille shutters automatically open at low speeds to allow more airflow over the engine for cooling, and automatically shut to improve aerodynamics at high speeds. Wind tunnel tests have shown these systems contribute nearly 0.2 kilometer/liter (0.5 mile/gallon) in combined city and highway driving. These systems can be found as standard or optional on the 2013:

- Chevrolet Malibu Eco and the other GM Eco-assist vehicles.
- Dodge Dart.
- Ford Escape and Taurus.
- Ram 1500.

Notes

Objectives Worksheet

Active grille shutters automatically open at low speeds to allow more airflow over the engine for cooling, and automatically shut to improve aerodynamics at high speeds. All of the shutters are linked together, so one obstruction can bind the entire system.

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Topic A. Manufacturing Trends (cont'd)

Active grille shutters require inspection after a frontal collision, since the parts are just behind the grille. Look for obstructions that might prevent proper operation. All of the shutters are linked together, so one obstruction can bind the entire system. There is also electronics involved, including sensors, an actuator motor, connector, and wiring harness. All of these require inspection after a front collision.

Notes

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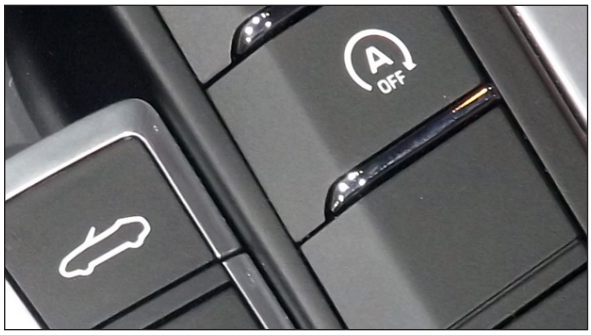
Topic A. Manufacturing Trends (cont'd)

A-7

Stop/Start Systems On Non-Hybrids



Stop/start systems are designed to stop the engine when at idle, such as at stoplights, and automatically start the engine again when the driver releases the brake pedal. All other systems that run off the engine, such as air conditioning, continue to operate. This is a common feature on hybrid vehicles. In 2013, they start to appear on non-hybrid vehicles in the U.S.

Stop/start systems:

- add to fuel efficiency and lower emissions. A U.S. Treasury report says Americans, as a whole, waste 1.9 billion gallons of gasoline per year in engine idle situations, such as traffic jams. Some countries have passed regulations to discourage idling. In Canada, for example, there is a law that makes idling in boats, vehicles, and even buses for more than one minute per hour punishable by a fine of up to $5,000.
- are featured on the 2013 Ford Fusion and Porsche 911 Carrera and Panamera. The 2013 Ram 1500 also features a stop/start system.

Notes

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Topic A. Manufacturing Trends (cont'd)

- have been popular in Europe since the 2010 model year. Volkswagen was the first to introduce a stop/start system on a Europe-only model in 1983. U.S. manufacturers felt the feature was not worth the extra expense in previous years. Adding a stop/start system does not change the numbers on the EPA mileage window sticker, since that test does not include stop-and-go traffic situations. Currently, there is only one stop in the EPA test.

Stop/start systems typically work by enhancing the starter motor, so it can handle the on/off cycling and provide seamless engine starts once a driver releases the brake pedal. A strong 12-volt battery and an electric pump allow the heating, ventilating, and air conditioning (HVAC) system to continue operating with the engine off.

Notes

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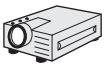
Topic A. Manufacturing Trends (cont'd)



A-8

Coasting Without The Engine

Porsche 911

Still another fuel-saving feature appearing on more vehicles is the engine disengaging when coasting at highway speeds or on slight downhill gradients, a feature called "coasting." Application examples include the:

- BMW ActiveHybrid 5.
- VW Jetta Hybrid.
- Porsche 911 Carrera and Panamera, both non-hybrids.

On hybrid applications, the engine switches completely off and the electric motor takes over. On the Porsche models, the engine still runs, but at idle speed.

Notes

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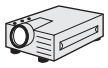
Topic A. Manufacturing Trends (cont'd)



A-9

More Diesels In U.S. Market

Porsche Cayenne

Diesels are being introduced in more numbers in the U.S. market. Evidence for 2013 includes:

- GM announcing the introduction of a diesel Chevrolet Cruze. A diesel Cadillac ATS is also being discussed.
- Porsche introducing a diesel Cayenne model in the U.S.
- Volkswagen offering a diesel Beetle and diesel Passat.

For several years, diesel-fueled vehicles have amounted to about half of all vehicle sales in Europe. One reason is that diesel is less costly than highly taxed gasoline in Europe, but another reason is that diesel has better fuel efficiency than gasoline.

Notes

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Topic A. Manufacturing Trends (cont'd)

A-10

More Plug-In Hybrids For 2013

Volvo XC60

The number of plug-in hybrids is still growing. The trend that started with the Chevrolet Volt and Fisker Karma continues with the 2013:

- Toyota Prius.
- Ford Fusion Energi.
- Ford C-MAX.
- Honda Accord.

Beyond 2013, there are plans for a plug-in hybrid:

- Cadillac.
- Mitsubishi Outlander.
- Volvo XC60.

Some vehicle makers, such as Nissan and Porsche, have dropped their hybrid models, and pure-electric vehicle makers are fewer. The Norwegian company that made the Think! electric vehicle has closed. Aptera, which was trying to get a pure-electric vehicle up and running, no longer exists.

Notes

Objectives Worksheet

The number of plug-in hybrids is still growing. The trend that started with the Chevrolet Volt and Fisker Karma continues with the 2013:

- Toyota Prius.
- Ford Fusion Energi.
- Ford C-MAX.
- Honda Accord.

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Topic A. Manufacturing Trends (cont'd)

On the other hand, Coda Automotive, another small vehicle maker trying to make a mark in the U.S. with a pure-electric sedan, is still selling the Coda pure-electric to California residents online. Also, the pure-electric Nissan Leaf is now available for a test drive at any Nissan dealership in the U.S.

Notes

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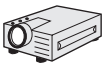
Topic A. Manufacturing Trends (cont'd)



A-11v

Video: Tech/Trends Trivia

Notes

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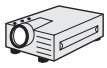
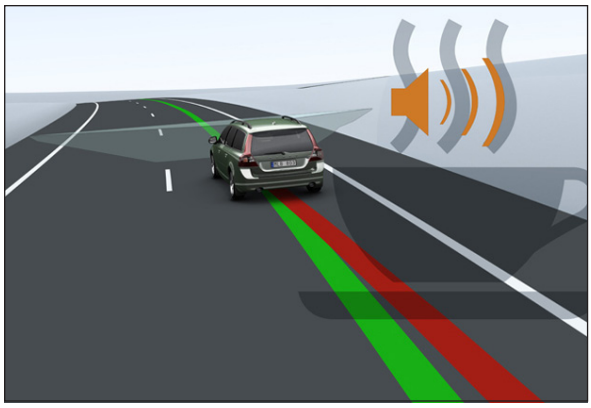
Topic A. Manufacturing Trends (cont'd)



A-12

Technology Trickles Down



Courtesy of Volvo Cars of North America

Another trend for the 2013 model year is the trickling down of technology that was once only available on luxury class vehicles. This same technology is now standard or optional on other vehicles. For this reason, repairers must stay up to date and become familiar with repair requirements on advanced electronic systems.

Examples of these systems include:

- lane departure warning. This is a safety feature that lets a driver know they have begun to cross over lane markers without signaling. Lane departure warning systems use cameras to sense the lane markings on pavement. Warnings to the driver may be audible or take the form of a vibration in the steering wheel or seat. Lane departure alert is required for a five-star safety rating from the National Highway Traffic Safety Administration (NHTSA).

Notes

Objectives Worksheet

A trend for the 2013 model year is the trickling down of technology that was once only available on luxury class vehicles. This same technology is now standard or optional on other vehicles. Examples of these systems include:

- lane departure warning.
- driver alert warning.
- blind spot warning.

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Topic A. Manufacturing Trends (cont'd)

- driver alert warning. Driver alert warning systems look for signs of an inattentive or tired driver. There are several ways to monitor the alertness or attention of a driver that range from lane departure to monitoring the driver's movements with cameras. The driver is warned with audible or visual alarms to take a break.
- blind spot warning. This warning system uses a radar or camera to detect and warn a driver that another vehicle is approaching in an adjacent lane. There may be an amber light on the door mirror when a vehicle is in the driver's blind spot. If the driver signals to move in that direction, an audible alert or flashing light is activated.

Notes

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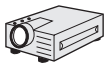
Topic A. Manufacturing Trends (cont'd)



A-13

Technology Trickles Down (cont'd)

Other examples of technology systems that are now more readily available include:

- adaptive cruise control. This feature uses radar or a laser to project a beam forward and maintain a set distance from the vehicle ahead. Some systems will also apply the brakes when needed to maintain a safe following distance, or even stop the vehicle completely.
- automatic high beams, which have a sensor to switch headlamps to high beam when no oncoming traffic is detected. The 2013 Ford Taurus is so equipped.
- brake assist. This feature, now standard equipment in some vehicles, recognizes when a driver wants to emergency stop. The system then applies full braking power, even if the driver has not pressed the brake pedal hard enough to do this. If the driver backs off the brakes, the system is overridden.

Notes

Objectives Worksheet

Other examples of technology systems that are now more readily available include:

- adaptive cruise control.
- automatic high beams.
- brake assist.
- park assist.

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Topic A. Manufacturing Trends (cont'd)

- park assist. This system alerts the driver with an audible beep when the vehicle is getting close to an object. There may also be a backup camera, which shows the area directly behind the vehicle when in reverse. Park assist also includes parallel parking with minimal input from the driver.

More information on damage analysis of systems such as lane departure warning and brake assist can be found in the I-CAR live *"Damage Analysys Of Advanced Automotive Systems (DAM07)."*

Notes

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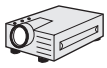
Topic A. Manufacturing Trends (cont'd)



A-14

More Autonomous Braking Systems

2013 Ford Escape

What the industry terms "autonomous braking systems" is in a separate trend category. These systems apply the brakes when the driver does not. Autonomous braking started with the Volvo "City Safety" system on the XC60 in 2010. 2013 examples include:

- Subaru "Eyesight Driver Assistance," found on the 2013 Subaru Legacy and Outback. This system is similar to the Volvo City Safety system.
- Ford "Curve Control," such as is found on the 2013 Escape. This system automatically brakes the vehicle if it is going too fast around a curve, preventing the driver from losing control or the vehicle tipping.
- Infiniti "Backup Collision Intervention" on the JX. The Infiniti system features a mix of radar in the quarter panels for cross traffic, and rear sonar sensors for objects in the rear. When backing up, the system gives the driver warning beeps and red lights. If the brakes are not applied, the system takes over and stops the vehicle.

Notes

There will be more on these individual examples with the different vehicle makes in the following modules.

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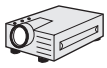
Topic A. Manufacturing Trends (cont'd)



A-15

Busy Steering Wheels

Infiniti M35h

Ford Focus ST

Subaru Outback

There is a trend to put more controls within the driver's reach, especially on the steering wheel. Many 2013 vehicles have busy steering wheels and center consoles.

Controls on the steering wheel may include settings for:

- cruise control.
- the radio, both station selection and sound levels.
- the navigation system.
- a hands-free telephone.
- paddle shifting.

This is in addition to turn signals, windshield wipers, and the horn.

Notes

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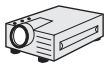
Topic A. Manufacturing Trends (cont'd)



A-16

Use Of Synthetic Oil

Volvo decided that synthetic oil will be standard on all Volvo models as of the 2013 model year. At least for Volvo, synthetic oil is just not a recommendation, but a requirement for the new vehicle warranty. The warranty will be void if synthetic oil is not used. Volvo specifically references "Castrol" oil, a brand known for its synthetics.

European vehicle makers have been switching to synthetic oil for several years now. Other vehicle makers from North America and Asia have also embraced synthetic oil. Toyota, for example, has been phasing in the recommendation on Toyota, Lexus, and Scion models since 2011.

The reason for synthetic oil includes:

- reduced friction and wear.
- fewer oil changes, which is better for the environment. For Volvo, 2013 will be the beginning of the 10,000 mile oil change interval recommendation.

Notes

Objectives Worksheet

Volvo announces synthetic oil will be standard on all Volvo models as of 2013. At least for Volvo, synthetic oil is just not a recommendation, but a requirement for the new vehicle warranty. The reason for synthetic oil includes:

- reduced friction and wear.
- fewer oil changes. For Volvo, 2013 will be the beginning of the 10,000 mile oil change interval recommendation.

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Topic A. Manufacturing Trends (cont'd)

A-17

Capless Fuel Fillers

Not having to worry about the fuel filler cap is catching on, at least in the North American market. Ford was the first vehicle maker to introduce a capless fuel filler, on the 2009 Explorer. In 2010, that was extended to all Ford and Lincoln vehicles. Chrysler added the feature on the 2011 300 and Dodge Charger, then GM on the 2013 Cadillac XTS.

There are pros and cons of capless fuel fillers. Pros include not having to worry about the cap getting lost when doing a repair, or scratching the finish when the cap is dangling. Also, the cap can be screwed on the wrong way, triggering a dash lamp. One con is that a special, vehicle maker-supplied funnel is required when adding fuel from a fuel container. This makes it less likely someone will siphon the fuel from the tank, but the funnel is another part that can get lost.

Notes

Objectives Worksheet

Ford was the first vehicle maker to introduce a capless fuel filler, on the 2009 Explorer. Chrysler added the feature on the 2011 300 and Dodge Charger, then GM on the 2013 Cadillac XTS. The 2013 ATS does not have a capless fuel filler.

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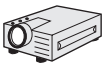
Topic A. Manufacturing Trends (cont'd)



A-18v

Video: Tech/Trends Trivia

Notes

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Topic A. Manufacturing Trends (cont'd)

A-19

The Rise Of Matte Finishes

Mercedes-Benz SL

There is a trend toward matte finishes, which is a finish without the gloss. There is still a clearcoat for ultraviolet ray protection, but the clearcoat has an added flattening agent. A matte finish can also be achieved at a lesser cost with a "matte wrap."

With a matte finish:

- there are no reflections, so all that is seen is the vehicle shape and color, what vehicle makers call "the pure design."
- the basecoat can be any color, not just white, black, and gray. All colors work with matte finishes.
- wax is never applied. Wax would shine, which is what is being avoided.

There will be information on repair of matte finishes later in this module.

Notes

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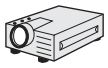
Topic A. Manufacturing Trends (cont'd)



A-20

Factory-Built Compressed Natural Gas (CNG)

There are at least two more factory-built compressed natural gas (CNG) vehicles for the 2013 model year, making this a trend. These vehicles include:

- the Ram 2500 Heavy Duty pickup, which seamlessly switches over to gasoline operation when the two CNG tanks are empty. Twin 4.6 cubic foot tanks, located next to each other in a box in front of the bed, store the equivalent of 18.2 gallons of gasoline.
- a GM Silverado and GMC Sierra 2500 Heavy Duty pickup.
- the Honda Civic GX, which has been available in select states for several years. The GX is now available in 36 states.

Ford has offered factory-made pickup and van CNG conversions since 2009.

Notes

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Topic A. Manufacturing Trends (cont'd)

CNG is less expensive and cleaner burning than gasoline, and is produced in the U.S. A problem is that it is available only at a relatively few fueling stations. As of March 2012, there were only about 1,500 CNG fueling stations in the U.S., and only half of these were accessible to the public. Most CNG fueling stations are operated by local governments or private companies for refueling CNG buses and other fleet vehicles.

Notes

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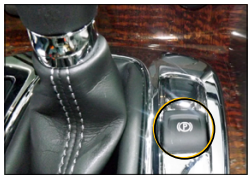
Topic A. Manufacturing Trends (cont'd)

A-21

More Electronic Parking Brakes

Chevrolet Impala



Chevrolet Traverse

Ford Fusion

For many vehicle models in 2013, putting on the emergency parking brake no longer requires pulling a lever or pushing a pedal, but pushing a button and letting an electrical circuit do the rest of the work. Electronic parking brakes:

- appeared first only on European makes, starting with Renault in 2001.
- are on several models for 2013, including Fords, GMs, Lexus models, and more.
- consist primarily of a switch, control module, and specially designed rear brake calipers. The brake calipers contain an electric motor, gearbox, and a shaft that presses on the brake pad when the switch is activated. There may be a self-locking thread on the shaft to retain the pressure on the pad when the vehicle is turned OFF.

Notes

Objectives Worksheet

For many vehicle models in 2013, putting on the emergency parking brake no longer requires pulling a lever or pushing a pedal, but pushing a button and letting an electrical circuit do the rest of the work. These are electronic parking brakes.

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Topic A. Manufacturing Trends (cont'd)

- have pros and cons. Pros include that there is more room without the brake lever, and the brake works in conjunction with the anti-lock brakes, so there is no possibility of brake lockup. Cons include that in an emergency stop, the button cannot be pressed any harder. Some electronic parking brakes do not work when the vehicle is moving forward, so assisting an emergency stop is not even possible. Another con is that this is another example of a button taking away manual control of the vehicle.

Notes

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Topic A. Manufacturing Trends (cont'd)

A-22

More Active Noise Cancellation Systems

Ford Fusion

Active noise cancellation systems, which reduce perceived noise from the engine, have become more complex and grown in numbers. These systems:

- are on more vehicles due to customer demand.
- have increased capabilities.
- use the existing audio system in the vehicle, as well as other parts.
- may have speakers in the headliner to augment the system.
- can be found, for example, on the 2013 Ford Fusion and Buick Encore.

Notes

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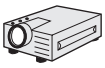
Topic A. Manufacturing Trends (cont'd)



A-23v

Video: Buick Noise Cancellation

This video shows parts of the active noise cancellation system on the 2013 Buick Encore.

Notes

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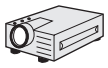
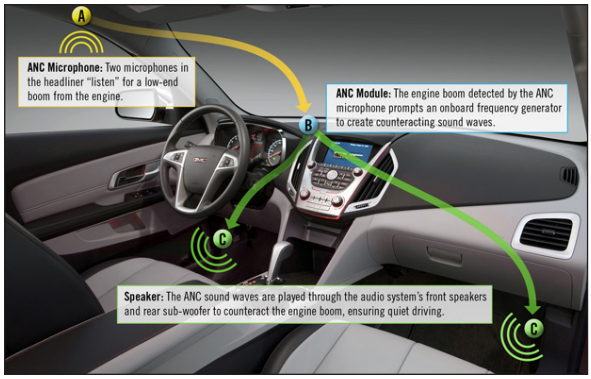
Topic A. Manufacturing Trends (cont'd)



A-24

GM Active Noise Cancellation (ANC) System


A
ANC Microphone: Two microphones in the headliner "listen" for a low-end boom from the engine.
B
ANC Module: The engine boom detected by the ANC microphone prompts an onboard frequency generator to create counteracting sound waves.
C
Speaker: The ANC sound waves are played through the audio system's front speakers and rear sub-woofer to counteract the engine boom, ensuring quiet driving.
C

© General Motors

The GM active noise cancellation (ANC) system:

- is only designed to cancel engine noise up to 2,000 RPM. It does not eliminate air leaks, road noise, or any other sounds from reaching the cabin interior.
- has four main parts:
  - The active noise cancellation module (computer)
  - Two microphones in the headliner to monitor the engine noise that is reaching the cabin interior
  - The audio amplifier, which sends out the noise cancellation tones, and the speakers
  - The subwoofer in the audio system, which is used for producing the noise cancellation tones

The system is electronic, and requires a scan tool and service information to troubleshoot the diagnostic trouble codes.

Notes

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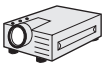
Topic B. Trends Due To Mandates



B-1v

Video: Tech/Trends Trivia

Notes

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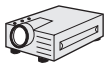
Topic B. Trends Due To Mandates (cont'd)



B-2

Mandatory Side Curtain Airbags

Suzuki Kazashi

All passenger vehicles operating in North America must have side curtain airbags as of model year 2013, per a ruling by the National Highway Traffic Safety Administration (NHTSA). Side curtain airbags must provide head and torso protection.

Side impact airbags that deploy from the seat backrest or door panel are not mandated, but most vehicles are equipped with them.

Notes

Objectives Worksheet

All passenger vehicles operating in North America must have side curtain airbags as of model year 2013, per a ruling by the National Highway Traffic Safety Administration (NHTSA). Side impact airbags are not mandated, but most vehicles are equipped.

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Topic B. Trends Due To Mandates (cont'd)

B-3

Better Curtain Airbags

Ford Explorer Cutaway

A new NHTSA ruling being phased in from 2013 to 2017 mandates an improved style of curtain airbags. This ruling:

- is Federal Motor Vehicle Safety Standard (FMVSS) 226 Ejection Mitigation.
- requires the side curtains to assist in ejection mitigation, which prevents occupants from being ejected through side windows in a rollover, even if the window is rolled down or destroyed.

Vehicle makers can meet this requirement in various ways. NHTSA anticipates that vehicle makers will modify the existing side curtains, possibly supplementing them with stronger glass. The new side curtains will likely have to:

- be larger to cover more of the window opening.
- stay inflated at least six seconds. Side curtains designed only for occupant protection generally stay inflated for less than one-tenth of a second.

Notes

Objectives Worksheet

A new NHTSA ruling being phased in from 2013 to 2017 mandates an improved style of curtain airbags. This ruling requires the side curtains to assist in ejection mitigation, which prevents occupants from being ejected through side windows in a rollover, even if the window is rolled down or destroyed.

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Topic B. Trends Due To Mandates (cont'd)

- be thicker, more robust, than current styles.
- have an attaching tether near the base of the airbag, preventing it from flopping out of the way during a rollover.

More information on the final rule of FMVSS 226 Ejection Mitigation can be found at: www.federalregister.gov. Do an article search for "FMVSS 226."

Notes

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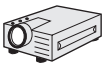
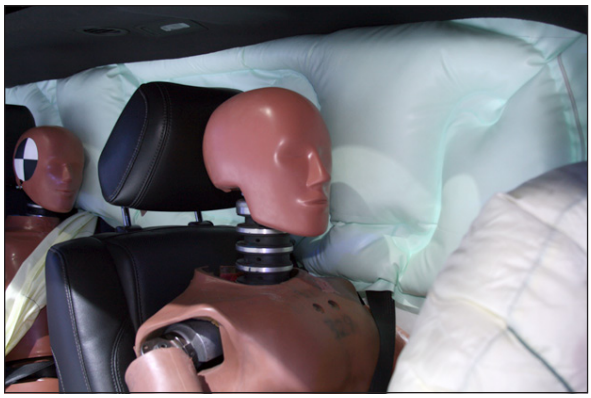
Topic B. Trends Due To Mandates (cont'd)



B-4

Better Curtain Airbags (cont'd)



The first side curtains to deploy in a rollover appeared as an option on the Ford Explorer and Mercury Mountaineer in 2002. It was called the "safety canopy." Ford is also ahead of the phase-in time for the ejection mitigation requirements, in that the side curtains on the 2013 Ford Escape stay deployed for six seconds.

Notes

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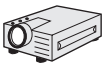
Topic B. Trends Due To Mandates (cont'd)



B-5

Brake Throttle Override Systems

NHTSA is considering requiring all passenger cars and trucks be equipped with brake throttle override systems, where the input to the brake pedal has the capability of overriding input to the accelerator pedal.

Most 2012 vehicles are already equipped. The trend owes its popularity to the much-publicized claims a few years ago of some Toyota vehicles accelerating on their own. The cause was thought to be electronic, resulting in a worldwide recall of nearly 19 million vehicles. A federal probe determined in early 2011 that the cause was floor mats entrapping the gas pedal.

NHTSA aims to minimize the risk of drivers losing control of their vehicles due to the accelerator getting stuck open for any reason.

More information on this proposed rule can be found at: www.federalregister.gov. Do an article search for "brake throttle override."

Notes

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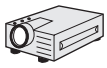
Topic B. Trends Due To Mandates (cont'd)



B-6

Standard Event Data Recorders

Event Data Recorders

This vehicle is equipped with an event data recorder (EDR). record, in certain crash or near crash-like situations, such a road obstacle, data that will assist in understanding how a v is designed to record data related to vehicle dynamics and s time, typically 30 seconds or less. The EDR in this vehicle is

- How various systems in your vehicle were operating;
- Whether or not the driver and passenger safety belts v
- How far (if at all) the driver was depressing the accele
- How fast the vehicle was traveling.

From Cadillac ATS Owner's Manual

In 2006, NHTSA issued a ruling on event data recorders (EDRs) that applies to 2013 and later models. EDRs, popularly called "collision black boxes," are devices that record certain information from a vehicle immediately before and during a serious collision. The ruling does not require EDRs be in all vehicles, though most vehicles contain an EDR. The ruling does:

- include, among other things, 15 standard data elements that all EDRs must record. These include a change in forward speed, whether seat belts were in use, and whether or not the entire event was recorded. Advanced EDRs must record 30 data elements.

Notes

More information on this proposed rule can be found at: www.federalregister.gov. Do an article search for "Event data recorders."

If there are any questions as to what the 15 requirements are, as of model year 2013, all EDRs must record:

1. Change in forward crash speed
2. Maximum change in forward crash speed
3. Time from beginning of crash at which the maximum change in forward crash speed occurs
4. Speed vehicle was traveling
5. Percentage of engine throttle, percentage full (how far the accelerator pedal was pressed)
6. Whether or not the brake pedal was applied
7. Ignition cycle (number of power cycles applied to the EDR) at the time of the crash
8. Ignition cycle (number of power cycles applied to the EDR) when the EDR data was downloaded
9. Whether or not the driver was using a seat belt

Objectives Worksheet

In 2006, NHTSA issued a ruling on event data recorders (EDRs) that apply to 2013 and later models. The ruling does not require EDRs be in all vehicles, though most vehicles contain an EDR. The ruling does make retrieval of the data easier. The data is still owned by the vehicle owner, so there must be vehicle owner's consent before data can be released.

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Topic B. Trends Due To Mandates (cont'd)

- make retrieval of the data easier. Vehicle makers must publicly share information about how to download EDR data. Police, collision investigators, and others can download the data from the EDR memory to help them better understand what happened to the vehicle and how the safety systems performed. The data is still owned by the vehicle owner, so there must be vehicle owner's consent before data can be released.
- require a statement in the owner's manual telling consumers that their vehicle has an EDR.

In order to be classified as an EDR, the device must at least be able to record vehicle speed before a collision, or speed change during the impact.

Notes

10. Whether or not the frontal airbag warning lamp was on
11. Driver frontal airbag deployment: time to deploy for a single stage airbag, or time to first stage deployment for a multi-stage airbag
12. Right front passenger frontal airbag deployment: time to deploy for a single stage airbag, or time to first stage deployment for a multi-stage airbag
13. Number of crash events
14. Time between the first two crash events, if applicable
15. Whether or not the EDR completed recording

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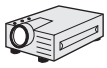
Topic B. Trends Due To Mandates (cont'd)



B-7

NHTSA Rearview Camera Requirement

NHTSA has proposed a new safety regulation requiring rearview cameras on all passenger vehicles by the 2014 model year. NHTSA has been considering requiring cameras since 2010, so many vehicle makers already have rearview cameras. The camera:

- provides a view behind the rear bumper.
- is considered better than park-assist sensors, which only provide an audible signal when the vehicle is getting close to something or someone.
- also offers a partial view of the blind spot, though the rearview camera is not considered a blind spot detection device.

Notes

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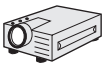
Topic C. New Equipment, Repair Procedures



C-1v

Video: Tech/Trends Trivia

Notes

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Topic C. New Equipment, Repair Procedures (cont'd)

C-2

Repair Of Matte Clearcoat

Audi R8

Paint maker Standox has listed some guidelines for repairing matte finishes. In general, more time and more materials are required than when repairing gloss finishes.

With matte finishes:

- do not sand or polish. This would add gloss.
- do not dab away tiny stone chips, or polish away minute scratches on panels, such as fingernail marks in door handle recesses. Do not even use a clay bar to remove a finish defect. Any of these results in small areas of gloss, which impair an otherwise evenly matte surface.
- blend-in repairs are not possible, as they would reduce the overall appearance. The entire panel must be repaired. Depending on where the damage is, it may even be advisable to repair a complete vehicle side.

Notes

Objectives Worksheet

With matte finishes:

- do not sand or polish.
- do not use a clay bar to remove a finish defect.
- blend-in repairs are not possible, as they would reduce the overall appearance. The entire panel must be repaired. Depending on where the damage is, it may even be advisable to repair a complete vehicle side.
- never use infrared curing. Air drying or forced oven drying also have different influences on the degree of gloss.

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Topic C. New Equipment, Repair Procedures (cont'd)

- do not use a mixing stick for formula amounts, but weigh the quantities of refinish clearcoat needed on the scale. Even minor deviations from the right mixing ratio of hardener, clearcoat, and thinner lead to changes in the level of non-gloss.
- correct flash off is important. To avoid glossy areas, the intermediate and final flash-off times in the technical data sheet should be strictly followed.
- never use infrared curing. Air drying or forced oven drying also have different influences on the degree of gloss.

Hyundai offers a matte finish for the 2013 Veloster Turbo. An 11-page owner's manual accompanies the matte finish option, which provides tips on caring for the finish. Among the rules from Hyundai:

- Use only products designated for matte finishes.
- Do not use any product that is mildly abrasive, such as compounds or glazes.
- Do not use terrycloth, cloth, or paper towels. Do not rub the finish vigorously. This will burnish the paint finish causing a permanent shiny spot. Shiny spots cannot be removed.
- Do not use commercial car washes.
- Use microfiber cleaning cloths with alcohol-based window cleaner for basic surface cleanup.

Notes

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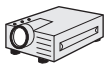
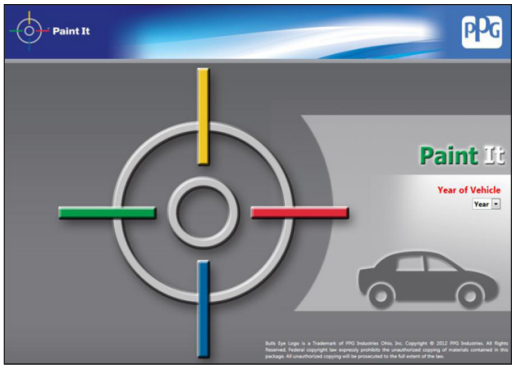
Topic C. New Equipment, Repair Procedures (cont'd)



C-3

PPG Launches "Paint It"



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Refinishers may find the new PPG "Paint It" website helpful. PPG has identified it as a new approach to color identification and selection. Paint It:

- is a free online color identification tool.
- can be found at www.ppgpaintit.com.
- provides a simple feature to identify vehicle colors by model year, manufacturer, model, color family, finish effect, or usage.

Notes

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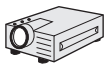
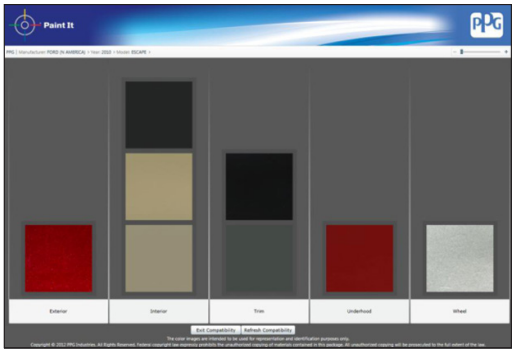
Topic C. New Equipment, Repair Procedures (cont'd)



C-4

PPG Launches "Paint It" (cont'd)



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The Paint It website not only identifies exterior colors. The site also identifies interior, trim, underhood, and wheel colors, which are sometimes hard to identify.

Notes

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Topic C. New Equipment, Repair Procedures (cont'd)

C-5

Stapling Plastic

A relatively new tool to assist with repairing plastic is available. This tool:

- is a hot stapler.
- is used with other repair methods, either adhesive or welding.
- adds a cross reinforcement on cracks or tears on the backside, to hold the pieces together and in alignment.
- can only be used on thermoplastics, not thermoset. Thermoplastics include polypropylene (PP) and thermoplastic polyolefin (TPO), which are common bumper cover materials.
- inserts the heated staple into the plastic, so adhesive or welding repairs can be done without having to hold the two pieces in alignment.

Notes

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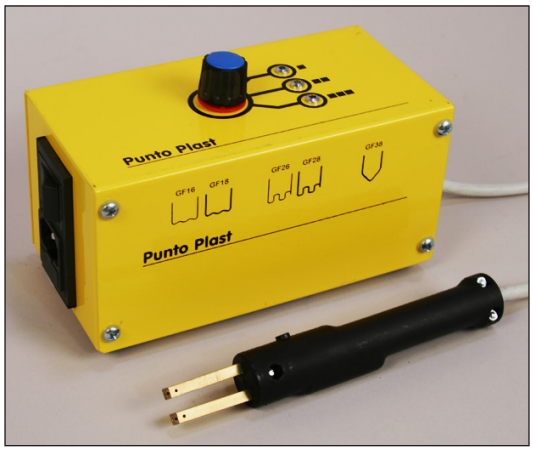
Topic C. New Equipment, Repair Procedures (cont'd)

C-6

Stapling Plastic (cont'd)



The plastic stapling tool:

- consists of a wand and heating unit. The staples are the only consumable.
- may have three heat settings.
- is available from at least three manufacturers: Urethane Supply Company, Chassis Liner Supply, and DentFix.

Notes

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Topic C. New Equipment, Repair Procedures (cont'd)

C-7

Portable 3D Measuring Equipment

Portable equipment that can do three-dimensional measuring for damage appraisals is not new, but the variety of equipment available has increased. All of these types of portable devices make it much easier to make three-dimensional measurements than having to use a dedicated bench. This type of equipment:

- does not require a bench. At least one does not even require the vehicle to be lifted. The Matrix Wand is held above the vehicle to take an image, which is then downloaded. The downloaded image is compared to factory specifications and the differences are shown on a screen.
- includes the Infinity XMS laser system, which uses a scanning device mounted on a tripod that emits laser beams that bounce off targets hung on the vehicle. An immediate readout shows where the vehicle is off of the factory specifications.

Notes

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Topic C. New Equipment, Repair Procedures (cont'd)

- includes the Spanesi system, which is a self-contained unit with a probing wand that is used to touch points on the vehicle. These points are immediately compared to the specifications for the vehicle. If the point is at specification, a chime is heard. If the point is out of specification, a buzzer is heard and the screen shows how far off.

Notes

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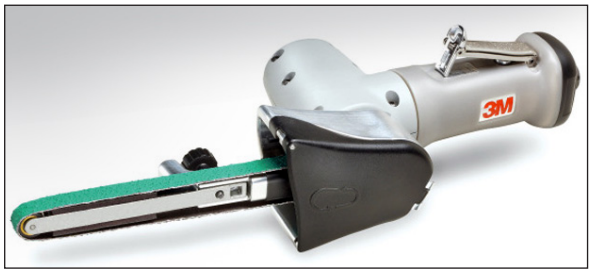
Topic C. New Equipment, Repair Procedures (cont'd)

C-8

3M File Belt Sander



The new 3M file belt sander is being introduced to the collision industry for an efficient way to remove spot welds on ultra-high-strength steel (UHSS). Instead of a special spot weld cutter or drill bit, there is a special abrasive belt that grinds off the spot weld.

The belt uses an exclusive fast cutting, durable abrasive mineral with Polycut™ grinding aid for faster and cooler grinding of UHSS and reduced abrasive loading when grinding aluminum.

The tool can also be used for dressing GMA (MIG) plug welds.

The thin, long belt is designed to access tight areas.

Notes

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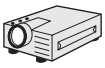
Topic D. Conclusion



D-1

Conclusion

Topics discussed in this module included:

- technologies on newer model vehicles that qualify as industry trends.
- trends resulting from mandates.
- new repair equipment.

Notes

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